

Simplify the following. All negative exponents MUST be rewritten using positive exponents. Show your work.

$$1. \frac{(2x)^3}{8x^3}$$

$$2. \frac{2b^3 \cdot 3b^4}{6b^7}$$

$$3. \frac{(x)^4(3x^2)^3}{27x^{10}}$$

$$4. \frac{\frac{2x^{-2}}{x^3}}{x^7}$$

$$5. \frac{\left(\frac{3a^3b^2}{6ab}\right)^4}{\frac{a^8b^4}{16}}$$

$$6. \frac{8x^{-9}}{x^9}$$

$$7. \frac{\left(\frac{4z^3}{5z}\right)^3 \left(\frac{4x}{5}\right)^{-3}}{z^4}{x^2}$$

$$8. \frac{\sqrt{840}}{2\sqrt{210}}$$

$$9. \frac{\sqrt{40a^3b^4}}{2ab^2\sqrt{10a}}$$

$$10. \frac{\sqrt[3]{343}}{7}$$

$$11. \frac{\frac{3x^{-2}}{x}}{x^4}$$

$$12. \frac{7(2mn^3)^4}{112m^4n^8}$$

$$13. \frac{\frac{2^3x^4yz^5}{2x^2y^3z}}{4z^4}{x^2y}$$

$$14. \frac{(m^2n^3p)(8mn^4p^6)}{8m^3p^7}{n}$$

$$15. \frac{\sqrt[3]{625y^7z^3}}{5yz^4\sqrt[4]{y^3z^2}}$$

$$16. \frac{(8x^4)^{1/2}}{\sqrt{8x^4}}{2x^2\sqrt{2}}$$

$$17. \frac{(2x^0)^0(4y)^2}{16y^2}$$

$$18. \frac{(-3x^4)^2}{9x^8}$$

$$19. \frac{8m(n^3p^2m^4)^{1/3}}{8m^2n^3\sqrt[3]{p^2m}}$$

$$20. \frac{\sqrt[3]{-625rs^2t^5}}{-1st\sqrt[5]{625rs^2t}}$$

$$21. \frac{(243n^5)^{1/2}}{3n^3\sqrt[3]{9n^2}}$$

$$22. \frac{\left(\frac{r^6}{r^3t^4}\right)}{t^2}{r^2}$$

$$23. \frac{4x^{-3}y^4}{4y^4}{x^3}$$

$$24. \frac{(4x^{-3}y^4)^{-2}}{x^6}{16y^8}$$

$$25. \frac{\sqrt[3]{4r^{10}s^{12}t^{30}u^{36}}}{rst^5u^6\sqrt[6]{4r^4}}$$

## More Properties of Exponents

Simplify. Your answer should contain only positive exponents.

$$1) (x^{-2}x^{-3})^4 = \frac{1}{x^{20}}$$

$$2) (x^4)^{-3} \cdot 2x^4 = \frac{2}{x^8}$$

$$3) (n^3)^3 \cdot 2n^{-1} = 2n^8$$

$$4) (2v)^2 \cdot 2v^2 = 8v^4$$

$$5) \frac{2x^2y^4 \cdot 4x^2y^4 \cdot 3x}{3x^{-3}y^2} = 8x^8y^6$$

$$6) \frac{2y^3 \cdot 3xy^3}{\cancel{3}x^2y^4} = \frac{2y^2}{x}$$

$$7) \frac{x^3y^3 \cdot x^3}{4x^2} = \frac{x^4y^3}{4}$$

$$8) \frac{3x^2y^2}{2x^{-1} \cdot 4yx^2} = \frac{3xy}{8}$$

$$9) \frac{x}{(2x^0)^2} = \frac{x}{4}$$

$$10) \frac{2m^{-4}}{(2m^{-4})^3} = \frac{m^8}{4}$$

$$11) \frac{(2m^2)^{-1}}{m^2} = \frac{1}{2m^4}$$

$$12) \frac{2x^3}{(x^{-1})^3} = 2x^6$$

$$13) (a^{-3}b^{-3})^0 = 1$$

$$14) x^4y^3 \cdot (2y^2)^0 = x^4y^3$$

$$15) ba^4 \cdot (2ba^4)^{-3} = \frac{a}{8b^{14}}$$

$$16) (2x^0y^2)^{-3} \cdot 2yx^3 = \frac{1x^3}{4y^5}$$

$$17) \frac{2k^3 \cdot k^2}{k^{-3}} = 2k^8$$

$$18) \frac{(x^{-3})^4 x^4}{2x^{-3}} = \frac{1}{2x^5}$$

$$19) \frac{(2x)^{-4}}{x^{-1} \cdot x} = \frac{1}{16x^4}$$

$$20) \frac{(2x^3z^2)^3}{x^3y^4z^2 \cdot x^{-4}z^3} = \frac{8x^{10}}{y^4z^3}$$

$$21) \frac{(2pm^{-1}q^0)^{-4} \cdot 2m^{-1}p^3}{2pq^2}$$

$$22) \frac{(2hj^2k^{-2} \cdot h^4j^{-1}k^4)^0}{2h^{-3}j^{-4}k^{-2}} = \frac{h^3j^4k^2}{2}$$

Simplify the following. All negative exponents must be rewritten using positive exponents.

\*\*\* Use your toolkit cards to assist you!!!

1.  $\sqrt{32}$

$4\sqrt{2}$

2.  $\sqrt{344}$

$2\sqrt{86}$

3.  $3(m^3np^{-3})^2$

$\frac{3m^4n^2}{p^6}$

4.  $3(m^3np^{-3})^{-2}$

$\frac{3p^6}{m^4n^2}$

5.  $\frac{9x}{18x^3y}$

$\frac{1}{2x^2y}$

6.  $\sqrt[3]{363n^4}$

$11n^2\sqrt{3}$

7.  $(-5xy^3)^3$

$-3125y^{25}x^3$

8.  $\frac{5}{(4x)^{-2}}$

$80x^2$

9.  $\sqrt{x^3y^3z^6}$

$xyz^3\sqrt{y}$

10.  $2x(xy^3z)^3$

$2x^4y^{12}z^3$

11.  $\sqrt{3042}$

~~$30\sqrt{2}$~~

$12\sqrt{21}$

12.  $\sqrt{625r^4s}$

$25r^2\sqrt{s}$

13.  $\frac{-18m^3n^2r}{12m^3nr^{18}}$

$\frac{-3mn^2}{2r^{16}}$

14.  $(-2xy)(4x^3y)$

$-8x^4y^2$

15.  $4ab^3c^3 + 4^3ab^3c^3$

$256a^2c^6$

16.  $\frac{3^3d^4e^3f^2}{3d^4e^3f^2}$

$\frac{3d^4f^4}{e^4}$

17.  $10^3u^4v^4w + 10^2u^4v^4w^9$

$100000u^7v^5w^9$

18.  $\sqrt{25920}$

$72\sqrt{5}$

19.  $(2gh)^3(15gh)^3$

$1800g^5h^{5.5}$

20.  $\frac{-30x^3y^4z}{(xyz^3)^4}$

$\frac{-30y}{z^5}$

21.  $\sqrt{80}$

$4\sqrt{5}$

22.  $\sqrt{208}$

$4\sqrt{13}$

23.  $\sqrt{588}$

$14\sqrt{3}$

24.  $\sqrt{k^3l^3m^4n^3}$

$k^3lm^2n\sqrt{Kn}$

25.  $\sqrt{-169}$

undefined